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*Indian Standard*

**SPECIFICATION FOR  
AIR RECEIVERS FOR COMPRESSED  
AIR INSTALLATION**

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 RAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*Indian Standard*

# SPECIFICATION FOR AIR RECEIVERS FOR COMPRESSED AIR INSTALLATION

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# *Indian Standard*

## SPECIFICATION FOR AIR RECEIVERS FOR COMPRESSED AIR INSTALLATION

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 29 January 1976, after the draft finalized by the Compressors Sectional Committee had been approved by the Mechanical Engineering Division Council.

**0.2** The need for a standard on air receivers for compressed air installations has been felt for quite sometime by the air compressors industry. This standard has been formulated keeping in view the international practices in this field.

**0.3** In the preparation of this standard, considerable assistance has been obtained from the leading manufacturers and users in this country.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard provides general guidance on air receivers for compressed air installations, where design pressure does not exceed 16 bar.

### 2. DEFINITION

**2.1 Air Receiver** — Any fusion welded vessel intended to contain air or inert gas above atmospheric pressure but not exceeding 16 bar.

### 3. GENERAL REQUIREMENTS

**3.1** Air receivers help to dampen out pulsations due to reciprocating actions and shall help to condense and trap, as much as possible the moisture in the compressed air, and also to let oil and other impurities settle down before air passes into the piping.

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\*Rules for rounding off numerical values ( revised ).

**3.2** Air receiver shall provide a 'flywheel effect', that is, it shall meet the varying demands without compressor regulation functioning incessantly. Air receivers are, therefore, also used for storage of air.

#### **4. LOCATION**

**4.1** In order to obtain as much cooling effect as possible the receiver shall preferably be installed outdoors or in an open shed. It shall be supported off the ground to prevent rusting.

**4.1.1** In a long distribution line it pays to instal one or more receivers farther on in the system or at a point of intermittent heavy demand.

#### **5. SIZE**

**5.1** The capacity of the receiver shall be one-tenth of the free air delivery per minute of the compressor, increasing with smaller compressors to about one-sixth. This should be regarded as a minimum. A much bigger capacity shall be needed to provide any appreciable storage of air. This is not applicable to portable compressors. In the case of rotary compressors, a receiver of this capacity shall be in addition to the receiver forming part of the compressor design.

**5.1.1** If the air receiver is also to be used for storage of air, the following formula may be used for determining its size:

$$T = \frac{V (P_1 - P_2)}{C \times P_0}$$

where

$T$  = time in hours receiver supplies air from upper to lower pressure limits;

$V$  = volume of receiver in  $\text{m}^3$ ;

$P_0$  = atmospheric pressure in bar;

$P_1$  = maximum pressure, absolute in bar (compressor discharge pressure);

$P_2$  = minimum receiver pressure, absolute in bar (pressure required to operate tool); and

$C$  = amount of free air drawn per hour in  $\text{m}^3$  (from study of local cycle).

#### **6. MANUFACTURE**

**6.1** Air receivers shall be manufactured according to IS : 2825-1969\* but the design pressure shall be assumed as maximum working pressure plus 10 percent. Receivers up to a pressure of 3.5 bar shall be regarded as Class III vessels and those with higher pressures as Class II.

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\*Code for unfired pressure vessels.



## 7. MOUNTINGS

**7.1 Safety Valve** — Each air receiver shall be provided with a safety valve preferably of the direct spring loaded type and shall be so constructed and adjusted as to permit the air to escape from the air receiver without increasing the pressure beyond 10 percent above the working pressure when the air compressor or compressors are giving full output and all outlets other than safety valve or valves are closed.

**7.1.1** Safety valves shall be fitted with hand lifting gear. It shall be possible to lift the valve spindle at a pressure not less than 75 percent of working pressures.

**7.1.2** Safety valves shall be fitted with a protecting cap or ferrule under the adjusting screw, so that they cannot be inadvertently overloaded beyond the pressure at which they have been adjusted.

**7.2 Drain Valve** — A drain valve or cock shall be provided either for manual or automatic operation, at a point for enabling the draining of the condensate.

**7.3 Pressure Gauge** — A pressure gauge shall be fitted to each receiver. The bourdon type of gauge conforming to IS : 3624-1966\* is recommended. The dial shall be graduated in bar and the graduation shall be from zero to not less than one-and-half times, and not more than twice the design pressure of the receiver.

**7.4 Fusible Plugs** — Fusible plugs may be fitted to safeguard the installation in case of excessive rise in temperature due to fire.

**7.4.1** The position of fusible plug where fitted shall be such that discharge of the plug will not do injury to any person.

## 8. ACCESS AND INSPECTION OPENINGS

**8.1** Each air receiver shall be provided with openings for cleaning and inspection. Holes for pipe connection may be used for this purpose provided they are of sufficient size. The recommended number and size of these access holes are as follows:

<i>Inside Vessel Diameter, mm</i>	<i>Opening</i>
Up to 230	Two openings each 30 mm clear bore
230 „ 400	„ „ „ 45 mm „ „
400 „ 600	„ „ „ 90 mm circular
	or
600 „ 900	Two elliptical openings of 90 × 70 mm One manhole or two elliptical openings of 125 × 75 mm and if circular of equivalent area

\*Specification for bourdon tube pressure and vacuum gauges.

*Inside Vessel  
Diameter, mm*

*Opening*

900 and above

At least one manhole or two  
elliptical holes of 150 × 100 mm  
and if circular of equivalent area

Manholes shall be at least 450 mm diameter if circular or 450 × 400 mm if elliptical.

## **9. INSPECTION AND TESTS**

**9.1 Inspection** — The requirements of inspection shall be as given in IS: 2825-1969\*.

**9.2 Hydraulic Test** — Every receiver shall be tested at the manufacturer's works by hydraulic pressure to 1.5 times the design pressure. While under pressure the air receiver shall be struck with a hammer on both sides and close to welded seams and a thorough examination made. The pressure shall be maintained for 10 minutes.

## **10. INSTALLATION**

**10.1** Proper foundation details for the receiver and the support shall be provided by the manufacturer.

## **11. SURFACE TREATMENT**

**11.1** An appropriate surface protection shall be given inside and outside of air receiver to prevent corrosion.

## **12. MARKING**

**12.1** Each vessel shall bear legible and durable indication of the following:

- a) Manufacturer's name or identification mark,
- b) Maximum working pressure in bar,
- c) Test pressure in bar,
- d) Specification to which the vessel is manufactured,
- e) Date of test, and
- f) Year of manufacture.

### **12.2 BIS Certification Marking**

The product may also be marked with Standard Mark.

**12.2.1** The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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\*Code for unfired pressure vessels.

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